



DemandUp

Unit Planning Module

The Power of Artificial Intelligence in Demand Forecasting

Integrating Historical Data, Market Trends, Seasonal Factors and Marketing Actions

... a Business Content within SAP Analytics Cloud®

Solutions for Today's Business Challenges

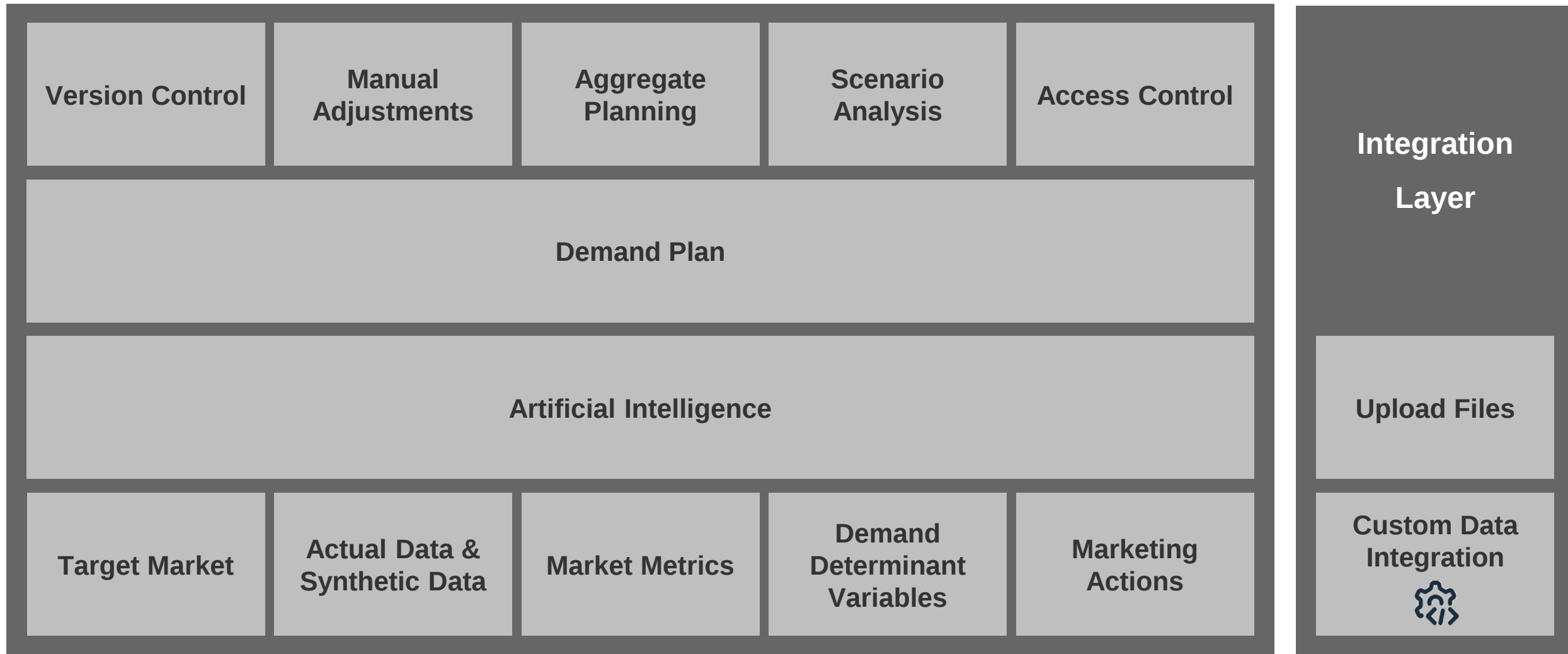


The Strategic Impact of Demand Planning

Imagine a conductor leading a symphony. Each musician, each instrument, must enter at the exact moment to create perfect harmony. In the same way, demand planning is the conductor that orchestrates a company's operations, ensuring that all areas – from inventory to marketing, from sales to production – are synchronized to meet market needs. However, just like in a symphony, a slip-up can cause dissonance that reverberates throughout the organization. Therefore, accuracy in demand planning is not just a competitive advantage; it is an imperative necessity for operational excellence and business sustainability.

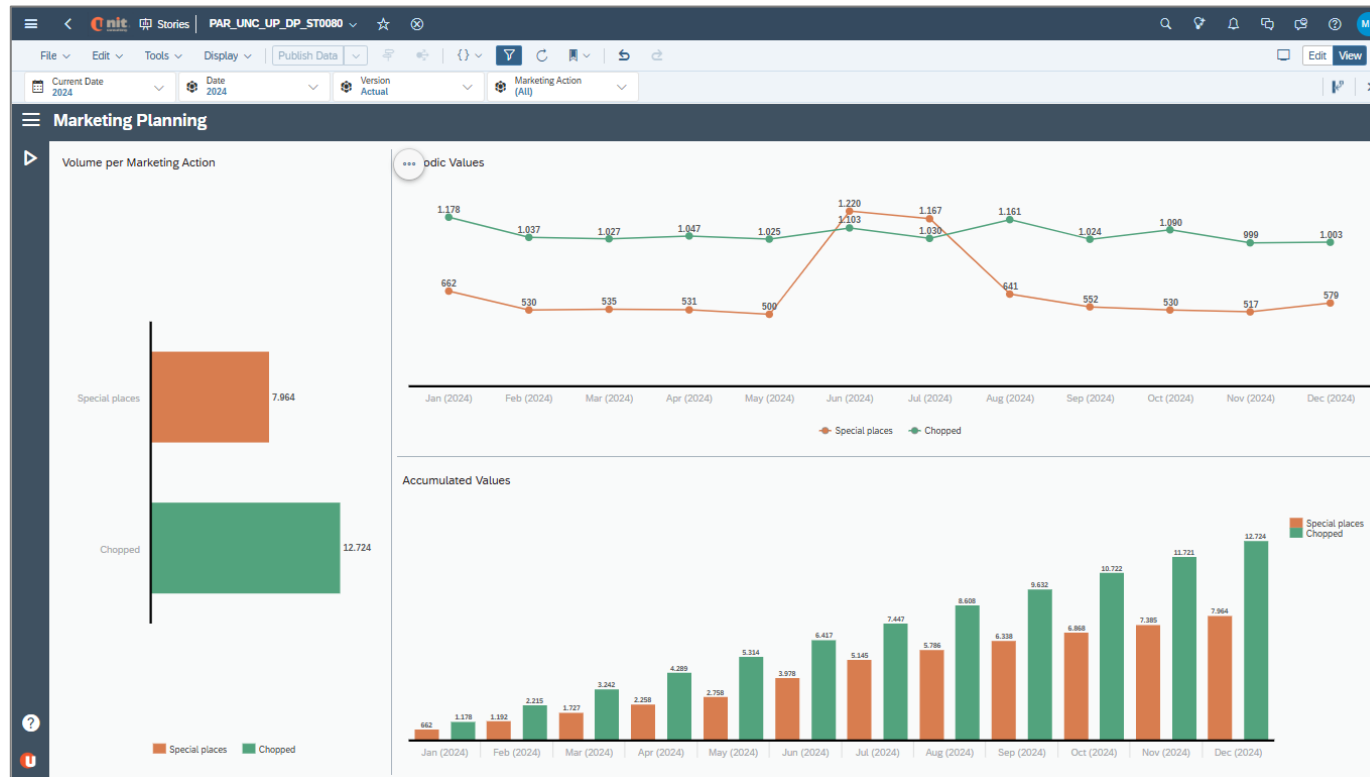
.. so, let's explore how to improve this critical process and the tangible benefits it can bring to the organization.

Framework for Demand Planning Solution



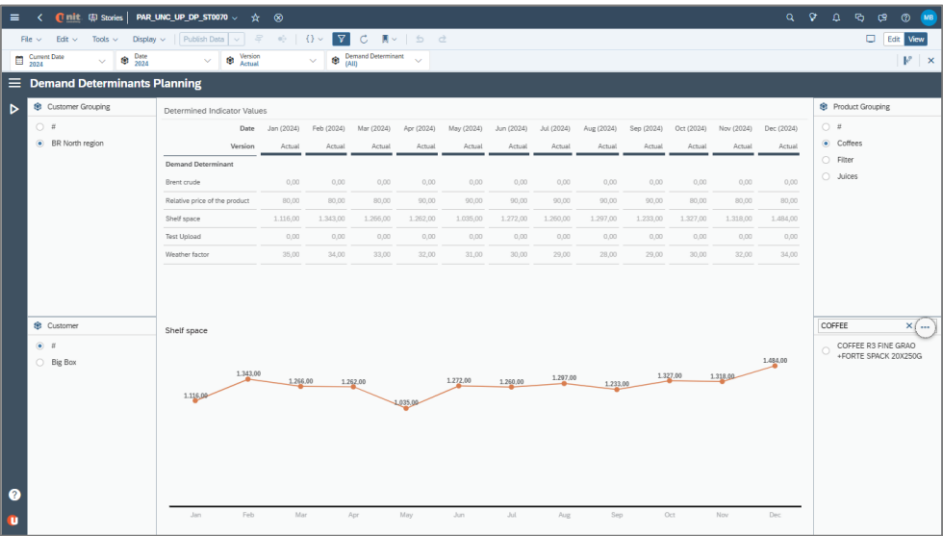
**Custom data integration is an on-demand service and is not included with the application.*

Marketing Action Planning



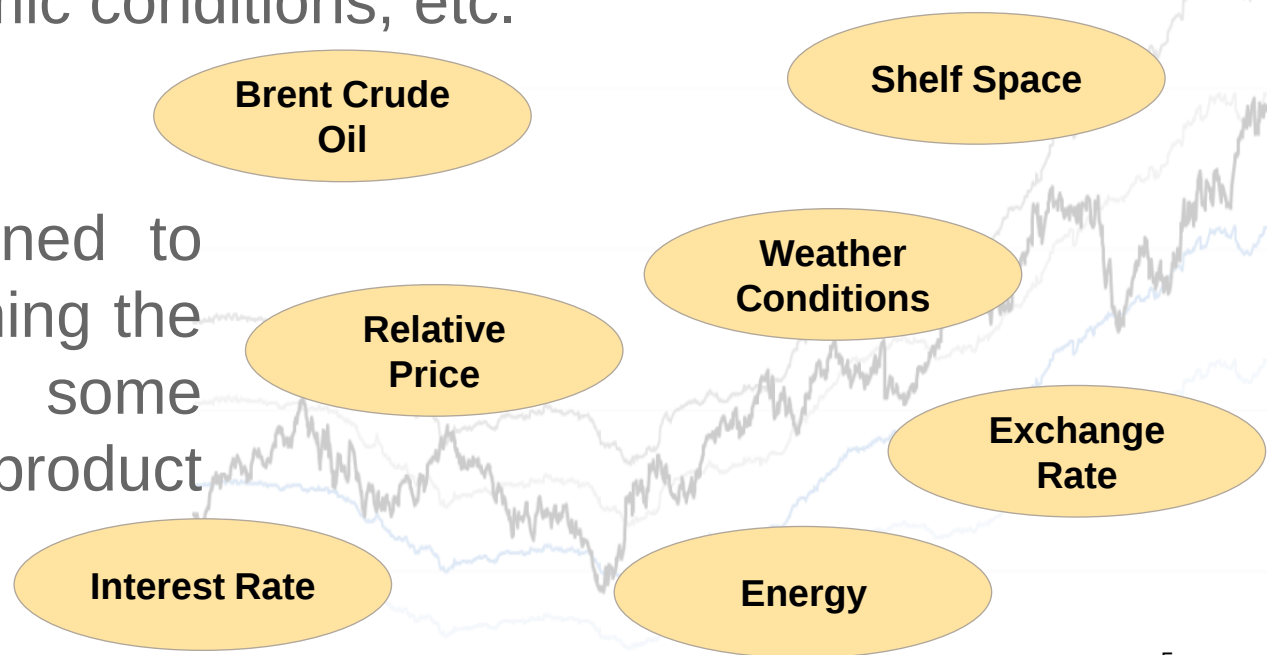
All marketing actions can be detailed and organized according to their nature, such as: Traditional advertising; Social media; Experience; Email; Product marketing; Discounts; etc. The planning process identifies the target market, the volumes to be worked on, as well as the period of execution of the actions.

Demand Determinant Variables



The determinants of demand variables refer to the factors that influence the quantity of a product or service that consumers are willing to buy, such as: the price of complementary and substitute goods; demographic factors; economic conditions; etc.

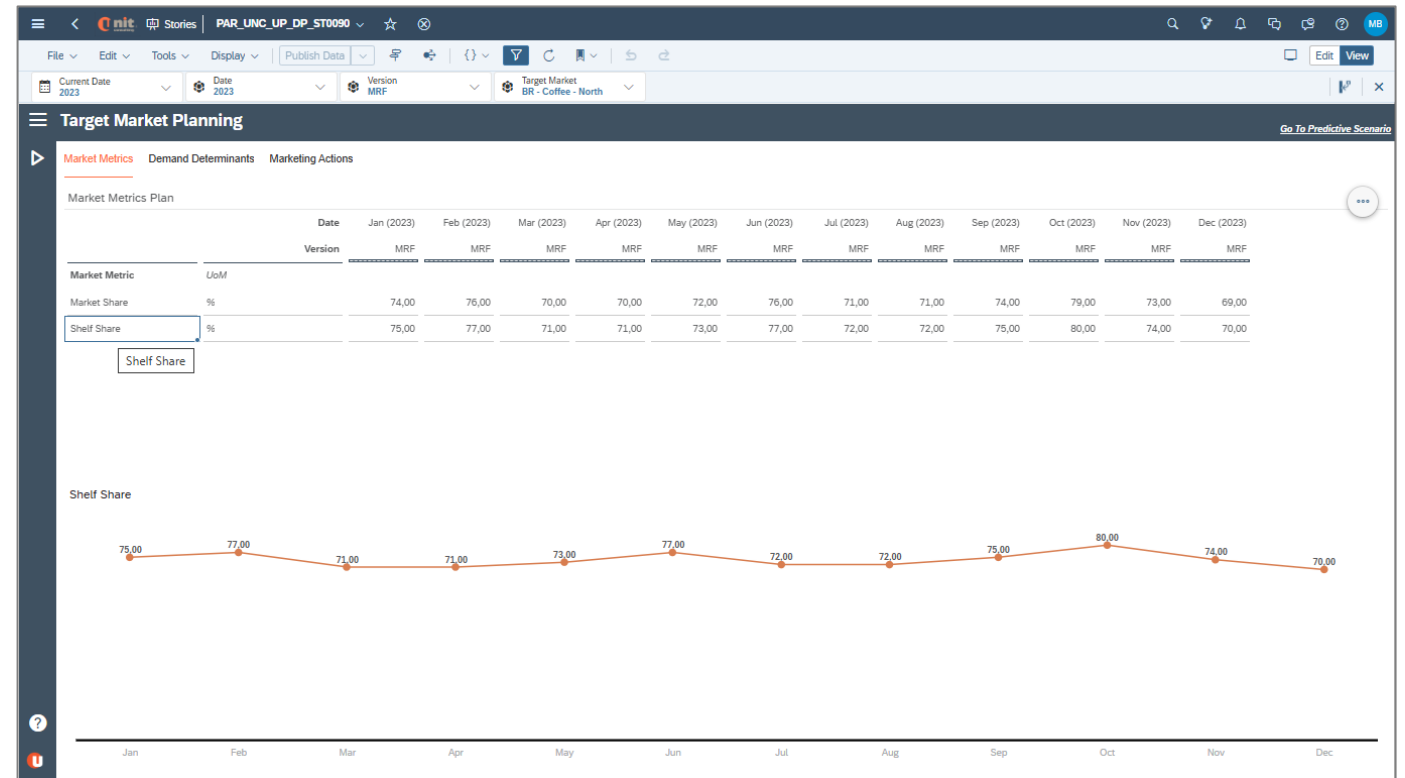
The variables have their values assigned to groups of products and customers, reaching the individual level, on which they exert some influence on the quantity of product consumption.



Market Metrics Planning

Metrics are indicators used to measure the effectiveness of campaigns and strategies, that help understand how marketing actions are impacting the business.

... Average Ticket
Sales Growth
Market Share
Customer Lifetime Value
Customer Acquisition Cost
Response Rate ...

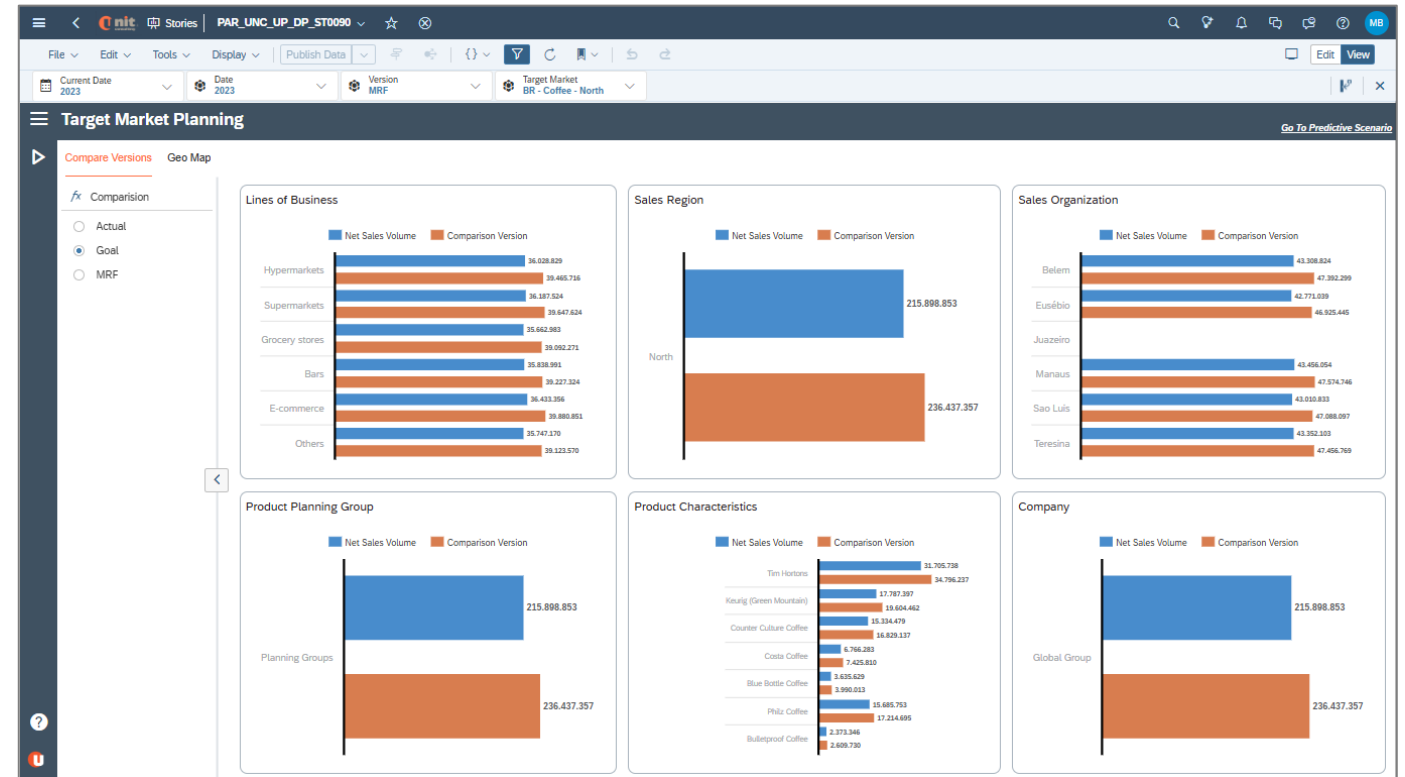


Version Control of Information

The solution includes numerous versions of business scenarios, highlighting:

- ❑ Actual Data
- ❑ Synthetic Data
- ❑ Planned Data
- ❑ Goal Data
- ❑ Budget Data
- ❑ Forecast Data

Forming the basis for analysis of variations and other comparisons.



Predictive Model

The SAP Analytics Cloud uses different algorithms to perform time series forecasts. The main algorithm used for this type of prediction is **Exponential Smoothing**, also known as **ETS** (Error, Trend, Seasonality). In addition, SAC also allows the use of **autoregressive models** such as **ARIMA** (AutoRegressive Integrated Moving Average), which is widely used to model time series, particularly when the data has more complex patterns.

Other components used by SAC include:

- ❑ **Trend and Seasonality Analysis:** Automatically identifies and models growth, decline, or cyclical repetition patterns.
- ❑ **Machine Learning Predictive Algorithms:** The tool can incorporate machine learning algorithms for more advanced predictions, including neural networks and regression.

This flexibility allows SAP Analytics Cloud to choose the most appropriate algorithm for the available dataset.

Predictive Model

Training Dataset

Name	Sex	City	Age	...	Marital status
Mike	Male	Miami	42		Married
Jerry	Male	New York	38		Single
Jessy	Male	Los Angeles	70		Single
Bryan	Male	Orlando	32		Divorced
Steve	Male	San Francisco	68		Married
Patricia	Female	Phoenix	29		Married
Sarah	Female	Orlando	28		Single
Monica	Female	Chicago	33		Married
Remy	Male	New York	27		Divorced
Peter	Male	Los Angeles	54		Single
Frederick	Male	Orlando	45		Single
Franck	Male	Phoenix	32		Married
Pamela	Female	Miami	23		Married
Nicky	Female	Memphis	82		Divorced
Britney	Female	Chicago	24		Divorced
Paul	Male	New York	19		Single

Training Set (75% of the original dataset)

Name	Sex	City	Age	...	Marital status
Mike	Male	Miami	42		Married
Jessy	Male	Los Angeles	70		Single
Steve	Male	San Francisco	68		Married
Patricia	Female	Phoenix	29		Married
Monica	Female	Chicago	33		Married
Remy	Male	New York	27		Divorced
Peter	Male	Los Angeles	54		Single
Franck	Male	Phoenix	32		Married
Pamela	Female	Miami	23		Married
Nicky	Female	Memphis	82		Divorced
Britney	Female	Chicago	24		Divorced

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Validation Set (25% of the original dataset)

Name	Sex	City	Age	...	Marital status
Jerry	Male	New York	38		Single
Bryan	Male	Orlando	32		Divorced
Sarah	Female	Orlando	28		Single
Frederick	Male	Orlando	45		Single
Paul	Male	New York	19		Single

Training

Smart Predict creates
several trial versions
using the training set.



Trial version 1



Trial version 2



Trial version 3



Trial version 4

Smart Predict selects
the best trial version.



Trial version 2

Validation

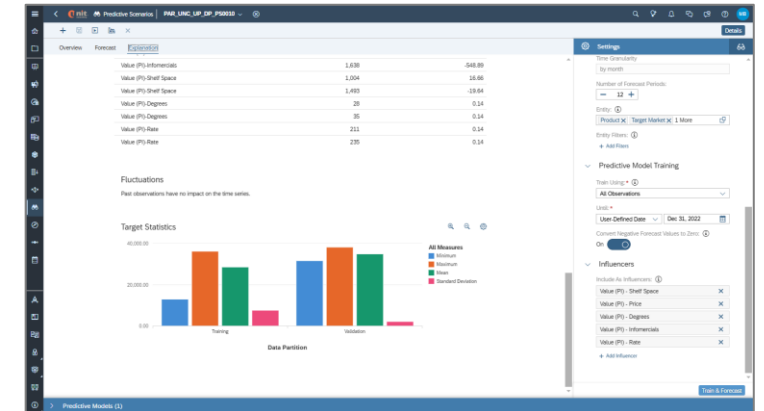
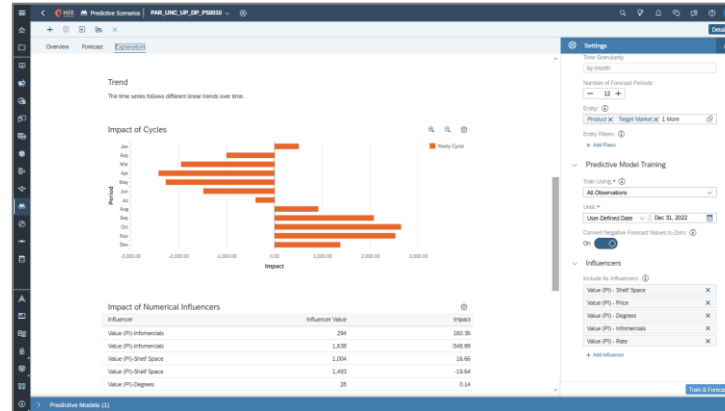
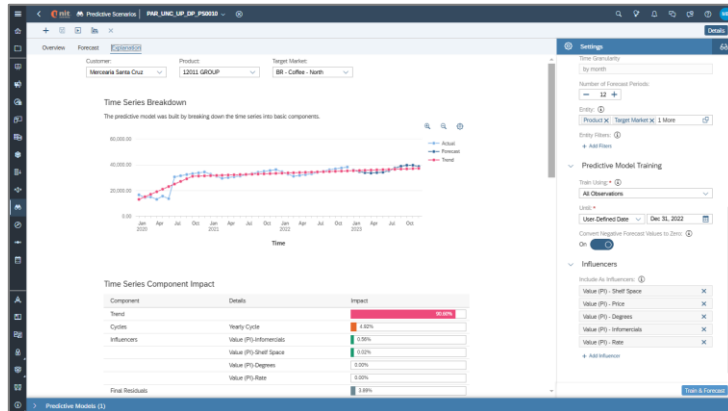
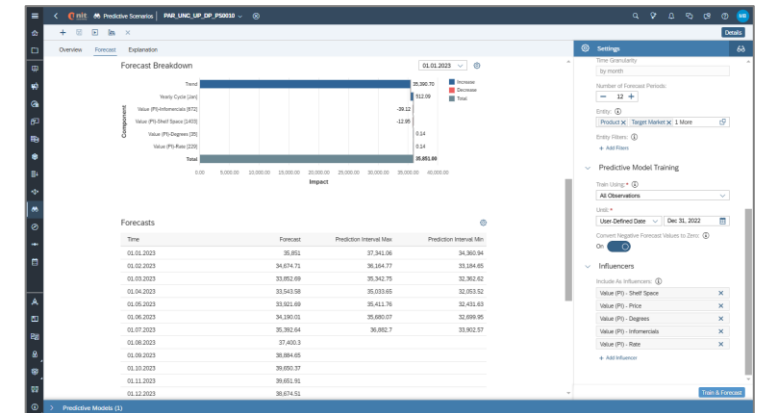
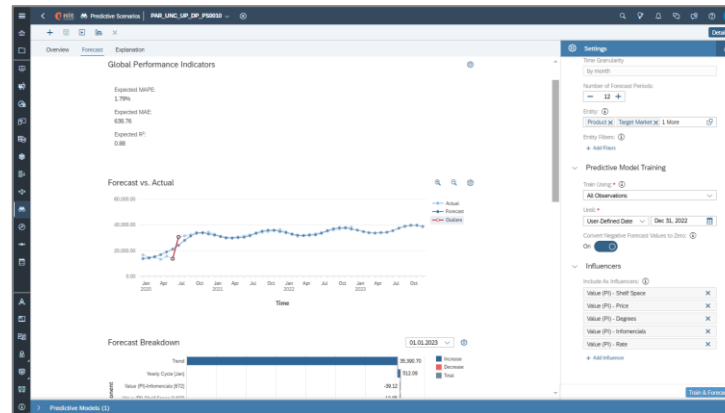
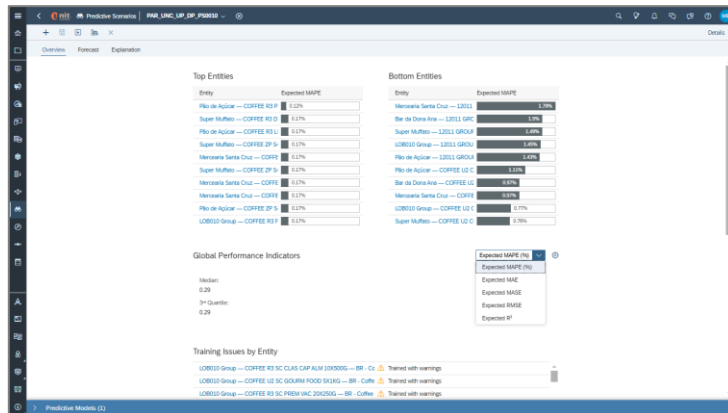
Smart Predict cross-validates
the best trial version with the
validation set.



Your Predictive Model

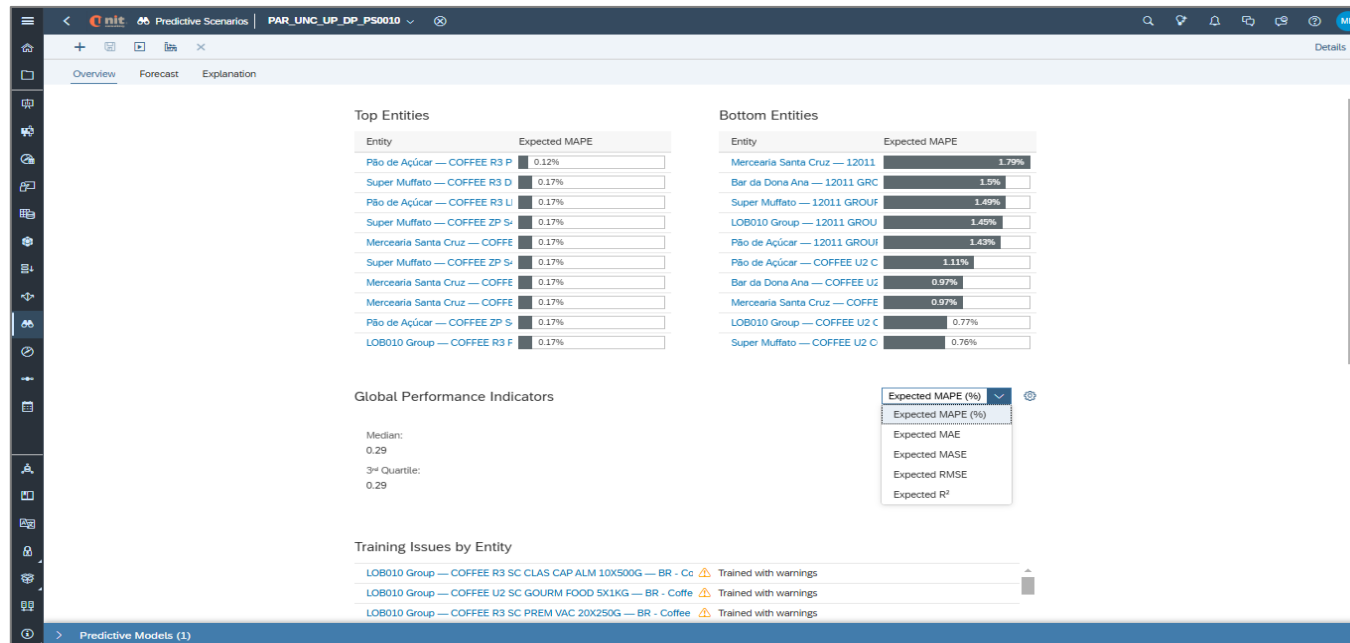
Predictive Model

Applying AI to the target market provides information about: Quality of predictions; Detailing of values; Anomalies detected; and Explanations about trends, cycles, influencers, fluctuations, validations, and so on.



Predictive Model

Is the main performance indicator high enough to consider my predictive model robust and accurate?



Expected MAPE (%)
Mean Absolute Percentage Error

Expected MAE
Mean Absolute Error

Expected MASE
Mean Absolute Scaled Error

Expected RMSE
Root Mean Squared Error

Expected R²
Coefficient of Determination

- ❑ Usually, the lower the performance indicator, the better your predictive model performance (except for the R² indicator).
- ❑ Expected MAPE is the default performance indicator.

Planning Interface

The planning interface is rich in functionality, allowing:

- ❑ Application of filters
- ❑ Copy / paste function
- ❑ Application of formulas
- ❑ Configure and execute allocations
- ❑ Add comments
- ❑ Plan at aggregated levels
- ❑ Trigger collaborative process
- ❑ Track changes
- ❑ Export to Excel or PDF
- ❑ Change hierarchies

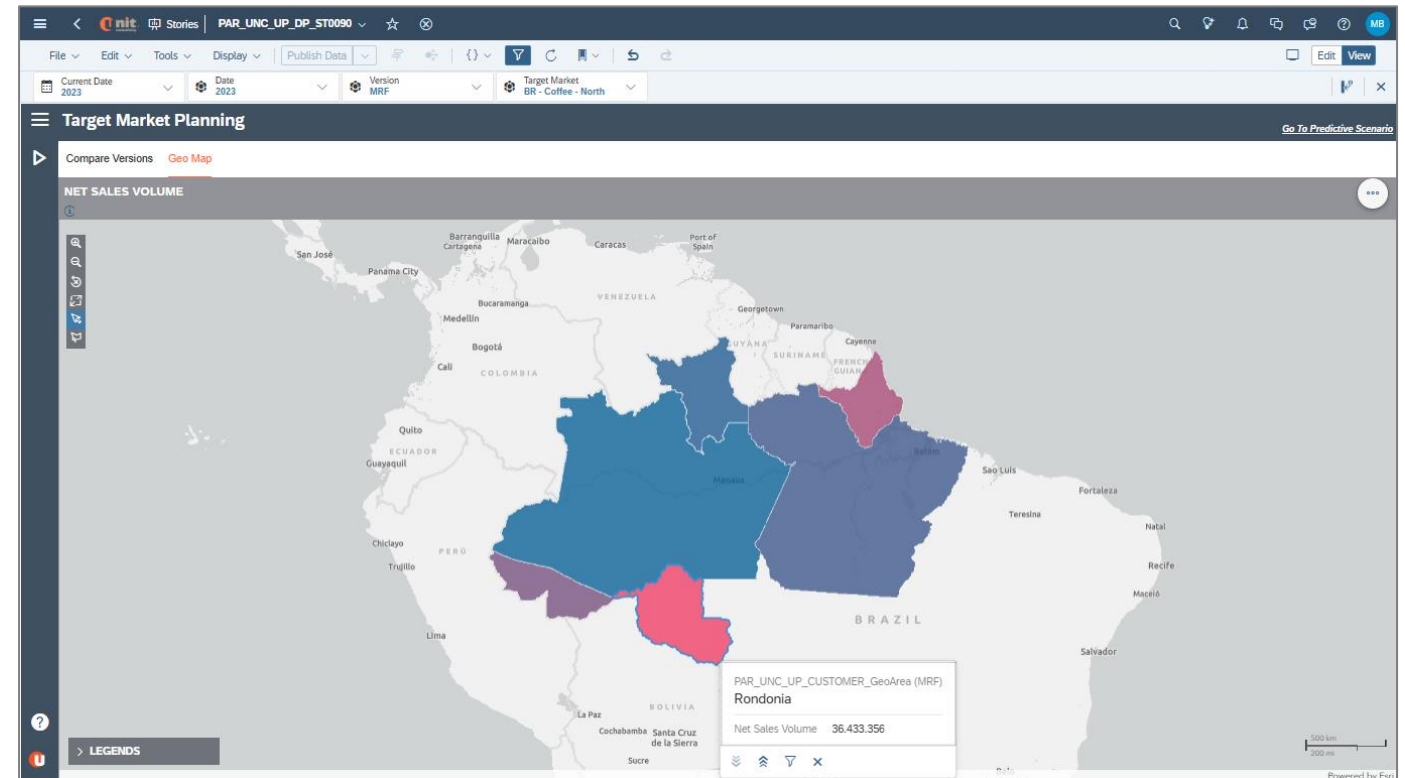
The screenshot displays the 'Target Market Planning' interface. It features a top navigation bar with options like 'File', 'Edit', 'Tools', 'Display', and 'Publish Data'. Below this, there's a 'Target Market Planning' section with tabs for 'Hierarchical View' and 'Aggregate View'. The main area shows a table of 'Net Sales Volume' with columns for 'Date' (Jan to Dec 2023) and 'Totals'. The table is organized by 'Sales Org.', 'Customer', and 'Product'. The 'Product' column includes categories like 'Business Units', 'Lines of Business', 'Characteristics', and specific brands like 'Tim Hortons', 'Keurig', and 'Costa Coffee'. The 'Totals' column shows the sum of sales for each product line.

			Date	Jan (2023)	Feb (2023)	Mar (2023)	Apr (2023)	May (2023)	Jun (2023)	Jul (2023)	Aug (2023)	Sep (2023)	Oct (2023)	Nov (2023)	Dec (2023)	Totals
			Version	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF	MRF
Sales Org.	Customer	Product														
> Business Units	> Lines of Business	> Characteristics		18,050,897	17,172,687	16,420,946	16,709,818	17,006,306	17,314,898	17,787,951	18,275,070	18,773,639	19,116,160	19,462,737	19,807,744	215,898,853
	> Bars	> Characteristics		2,995,307	2,850,565	2,725,265	2,773,363	2,822,960	2,874,354	2,952,790	3,033,729	3,116,697	3,173,795	3,231,225	3,288,940	35,838,991
	> E-commerce	> Characteristics		3,046,120	2,898,185	2,771,203	2,819,747	2,869,388	2,921,636	3,001,763	3,083,997	3,168,108	3,225,896	3,284,683	3,342,629	36,433,356
	> Grocery stores	> Characteristics		2,981,836	2,836,658	2,712,276	2,760,056	2,809,426	2,859,779	2,937,724	3,018,649	3,101,393	3,157,967	3,215,088	3,272,130	35,662,983
	> Hypermarkets	> Characteristics		3,012,748	2,865,893	2,740,921	2,788,974	2,837,955	2,889,573	2,968,673	3,049,710	3,132,586	3,189,524	3,247,546	3,304,725	36,028,829
	> Others	> Characteristics		2,988,644	2,843,016	2,718,474	2,766,349	2,815,790	2,867,048	2,945,290	3,026,031	3,108,659	3,165,624	3,222,520	3,279,725	35,747,170
	> Supermarkets	> Characteristics		3,026,241	2,878,369	2,752,806	2,801,329	2,850,787	2,902,508	2,981,711	3,062,953	3,146,196	3,203,353	3,261,675	3,319,594	36,187,524
		> COFFEES		3,026,241	2,878,369	2,752,806	2,801,329	2,850,787	2,902,508	2,981,711	3,062,953	3,146,196	3,203,353	3,261,675	3,319,594	36,187,524
		> Tim Hortons		439,940	418,835	400,518	407,697	415,019	422,491	433,917	445,690	457,816	466,142	474,635	483,297	5,265,996
		> Keurig (Green Mountain)		245,863	234,326	224,588	227,838	231,190	235,654	242,627	249,589	256,335	261,083	265,652	269,200	2,843,946
		> Counter Culture Coffee		228,629	217,655	208,229	211,949	215,742	219,613	225,535	231,632	237,913	242,228	246,627	251,114	2,736,865
		> Costa Coffee		92,098	87,668	83,874	85,372	86,900	88,459	90,844	93,301	95,832	97,568	99,340	101,148	1,102,405
		> Blue Bottle Coffee		51,399	48,922	46,803	47,639	48,492	49,362	50,693	52,063	53,475	54,445	55,436	56,443	615,171
		> Philz Coffee		219,258	208,679	199,646	203,213	206,890	210,560	216,239	222,085	228,108	232,243	236,462	240,765	2,624,100
		> Bulletproof Coffee		28,652	27,281	26,060	26,526	26,997	27,496	27,995	28,494	28,993	29,492	29,991	30,490	342,802
		> Kicking Horse Coffee		48,435	46,121	44,021	44,809	45,601	46,453	47,295	48,147	49,044	50,388	51,284	52,260	53,164
		> Ritual Coffee		32,272	30,746	29,363	29,894	30,434	30,980	31,827	32,691	33,572	34,183	34,803	35,429	386,196
		> Stumptown Coffee Roasters		39,385	37,483	35,860	36,500	37,155	37,821	38,840	39,890	40,972	41,715	42,473	43,245	471,338

... and much more!

Visualization and Analysis Layer

Additionally, the tool also has a vast set of functionalities, which enrich and simplify the visualization of information, accelerating the understanding of the business scenario presented.



Integration Layer

The screenshot displays a software interface for uploading files. At the top, there are three stacked buttons labeled 'Upload Files'. Below them is a section titled 'Level 5 Customer Group & Product Group' with a play button icon. The main part of the interface is a table with five columns: A (Date), B (Demand Determinant), C (Customer Grouping), D (Product Grouping), and E (Value). The table contains four rows of data. The first row has the values '202401', 'DD9000', 'NORTH', 'JUICE', and '50'. The second, third, and fourth rows are empty. At the bottom right of the interface is an 'Exit' button.

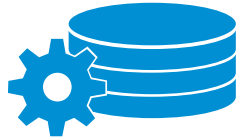
	A	B	C	D	E
1	Date	Demand Determinant	Customer Grouping	Product Grouping	Value
2	202401	DD9000	NORTH	JUICE	50
3					
4					

The application offers the ability to speed up the data entry process when users utilize the 'Upload Files' feature, available in planning transactions. Alternatively, you can opt for a development service to integrate the application with existing transactional systems.

SAP Analytics Cloud®



Cloud Solution
SaaS – Software as a Service
Scalability



Memory Computer



Artificial Intelligence
Machine Learning
Predictions



Interactive Dashboards
Planning and Simulations
User Experience



Mobility



Collaboration



Security and Governance
Compliance and Audit



Connectivity and Integration



Process Management



Internationalization

Benefits of the Solution

- ❑ **Increased Accuracy:** Analyzes large volumes of data and identifies complex patterns that would be difficult to detect manually, resulting in more accurate forecasts.
- ❑ **Operational Efficiency:** Automates forecasting processes, reducing time and resources spent, allowing teams to focus on strategic tasks.
- ❑ **Integration of Multiple Variables:** Utilizes a wide range of influencing variables, such as historical data, market trends, seasonal factors, and marketing actions, providing a holistic view of future demand.
- ❑ **Identification of Trends and Patterns:** Identifies trends and patterns that may not be apparent, helping companies anticipate changes in demand and prepare accordingly.
- ❑ **Reduction of Human Errors:** Minimizes the risk of human errors, ensuring greater reliability in the data and analyses performed.
- ❑ **Customization and Segmentation:** Detailed target market analysis and personalized forecasts for different segments, improving the effectiveness of marketing actions and demand planning.
- ❑ **Improved Inventory Management:** More accurate demand forecasts help optimize inventory levels, reducing costs associated with excess inventory or stockouts.
- ❑ **Support for Decision Making:** With accurate forecasts and detailed data, managers can make more informed and strategic decisions aligned with business objectives.
- ❑ **Comprehensive Support for the Planning Process:** Integration of synthetic data, collaboration, mobility and availability, processing speed, scenario understanding and analysis, simple and functional interfaces, operational management of the process.

... with low cost and effort.



"Elevate Your Forecast, Orchestrate Your Success"

Find out more at
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